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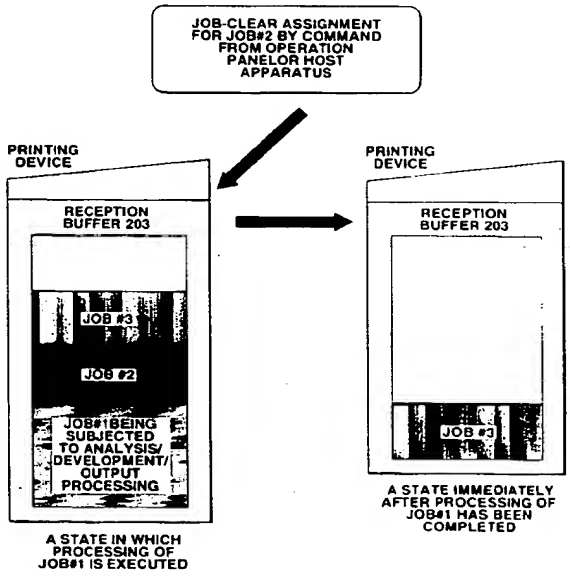
(54) Printing-information processing method and apparatus.

(57) In a printing-information processing method and apparatus, print jobs input from the outside are sequentially stored in a reception buffer, analysis information of each of the stored print jobs is stored in a page buffer in parallel with the reception of the print jobs, and page data obtained from the stored analysis information are sequentially stored in the frame buffer. At that time, data for assigning deletion of a job input from the outside is also stored. Hence, an assigned print job stored in the reception buffer, or analysis information or page data stored in the page buffer or the frame buffer, respectively, corresponding to the assigned print job is deleted by analyzing the stored data for assigning deletion of a job.

FIG.6



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BACKGROUDND OF THE INVENTION

Field of the Invention

This invention relates to a printing-information processing method and apparatus for a printer, in which buffers for temporarily storing data trasmitted from a host apparatus are provided.

Description of the Related Art

In conventional apparatuses of this kind, a buffer for temporarily storing data transmitted from a host apparatus is provided. Printing processing is executed by analyzing data stored in the buffer, executing, for example, bit-map development processing, and outputting an image signal to a printer engine.

In some apparatuses, the buffer can spool a plurality of data (jobs) transmitted from the host apparatus. Some apparatuses also have the function of deleting data temporarily stored in the buffer by an instruction from an operation panel of the main body of the apparatus so that the subsequent data can be received.

However, data deleting processing within the buffer of a conventional apparatus clears all storable regions. Hence, when a received unnecessary job is stored in an arbitrary order in the buffer, the succeeding job cannot be processed until the unnecessary job is output, and therefore a considerable time is required until the succeeding necessary job is output, causing, for example, a waste of paper resources. On the other hand, if the above-described deleting processing of the buffer is performed, communication processing for receiving again the necessary job from the host apparatus is required, and the host apparatus must retransmit the necessary job, causing, for example, a large loss in the data processing efficiency.

The present invention has been made in condiseration of the above-described problems.

It is a concern of the present invention to provide a printing-information processing method and a printing information processing apparatus, in which an arbitrary print job from among pring jobs sequentially stored in a reception buffer, and data stored in a page buffer and a frame buffer relating the print job can be selectively deleted based on input data for assigning deletion of a job.

According to one aspect, the present invention which achieves this object relates to a printing-information processing method and apparatus, in which data for assigning deletion of a job arbitrarily input by interrupt from the outside is stored while print jobs in units of a specific command group input from the outside are sequentially stored in a reception buffer, analysis information of each of the stored print jobs is stored in a page buffer, and page data obtained from the stored analysis information are sequentially stored in a frame buffer. The stored data for assigning deletion of a job is analyzed, and an assigned print job stored in the reception buffer, or analysis information or page data stored in the page buffer or the frame buffer, respectively, corresponding to the assigned print data is deleted.

In the printing-information processing method and apparatus of the present invention, print jobs input from the outside are sequentially stored in the reception buffer, analysis information of each of the stored print jobs is stored in the page buffer in parallel with the reception of the print job, and page data obtained from the stored analysis information are sequentially stored in the frame buffer. At that time, since data for assigning deletion of a job input from the outside is stored, an assigned print job stored in the reception buffer, or analysis information or page data stored in the page buffer or the frame buffer, respectively, corresponding to the assigned print job is deleted. Hence, even if a plurality of print jobs are stored in the reception buffer, only the assigned print job can be deleted, and analysis information or page data stored in the page buffer or the frame buffer, respectively, corresponding to the assigned print job can also be deleted.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional view illustrating the configuration of a printer to which a printing-information processing apparatus of the present invention can be applied;

FIG. 2 is a block diagram illustrating the configuration of a printing-information processing apparatus according to an embodiment of the present invention;

FIG. 3 is a flowchart illustrating a main processing procedure in the printing-information processing apparatus shown in FIG. 2;

FIG. 4 is a flowchart illustrating the procedure of first job-clear interrupt processing in the printing-information processing apparatus shown in FIG. 2;

FIG. 5 is a flowchart illustrating a detailed procedure of the analysis processing routine shown in FIG. 3;

FIG. 6 is a schematic diagram illustrating states of processing of deleting an assigned job in the printing-information processing apparatus of the invention; and

FIG. 7 is a flowchart illustrating the procedure of second job-clear interrupt processing in the printing-information processing apparatus of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

First Embodiment

FIG. 1 is a cross-sectional view illustrating the configuration of a printer to which a printing-information processing apparatus of the present invention can be applied, and illustrates the case of using a laser-beam printer (LBP). The LBP can register character patterns, document forms and the like from a data source (not shown).

In FIG. 1, main body (printer) 1500 of the LBP receives and stores print information (character codes and the like), form information, macro-instructions and the like supplied from a host computer connected to the LBP, forms character patterns (generated from character-pattern processing according to the invention), a form pattern and the like in accordance with the stored information, and forms an image on recording paper, serving as a recording medium. Operation panel 1501 includes switches for operations, an LED (light-emitting diode) display unit, and the like. Printer control unit 1000 controls the entire main body 1500 of the LBP and analyzes character information and the like supplied from the host computer. Printer control unit 1000 mainly converts character information into a video signal representing character patterns, and outputs the video signal to laser driver 1502.

Laser driver 1502 is a circuit for driving semiconductor laser 1503, and switches on and off laser light 1504 emitted from semiconductor laser 1503 in accordance with the input video signal. Laser light 1504 is deflected in directions perpendicular to the plane of FIG. 1 to scan and expose the surface of electrostatic drum 1506. Thus, an electrostatic latent image of character patterns is formed on electrostatic drum 1506. The latent image is developed by developing unit 1507 disposed around electrostatic drum 1506, and the developed image is transferred onto recording paper. The recording paper comprises cut sheets, which are accommodated within sheet cassette 1508 mounted in main body 1500 of the LBP. Each sheet of the recording paper is conveyed within the apparatus by sheet-feeding roller 1509, conveying roller 1510 and conveying roller 1511, and is supplied to electrostatic drum 1506.

FIG. 2 is a block diagram illustrating the configuration of a printing-information processing apparatus according to an embodiment of the present invention.

In FIG. 2, host computer 201, serving as a generation source of image information, transmits information 211, comprising character-code information, character-font information, form information, macro-registration information and the like, to input means 202 of the LBP. Reception buffer 203 temporarily stores various kinds of information input via input means 202. Character-pattern generator 210 includes a font ROM (read-only memory) storing pattern information for respective character codes, and a reading control circuit for the ROM. Character-pattern generator 210 has the code conversion function of calculating the address of the character pattern corresponding to an input character code.

CPU 204 controls the entire control system of the LBP, and controls the entire apparatus by control programs (whose flowcharts will be desribed later) of CPU 204 stored in ROM 206. Page buffer 205 analyzes the information stored in reception buffer 203, and stores data obtained by the analysis as intermediate data before development. Frame buffer 207 stores pattern information developed in character patterns for print images of at least one page. Output interface unit 208 generates a video signal corresponding to the pattern information from frame buffer 207, and executes interface control for printing mechanism (printer engine) 209. Printing mechanism 209 receives the video signal from output interface unit 208, and prints image information in accordance with the video signal.

In the printing-information processing apparatus having the above-described configuration, if data for assigning deletion of a job for deleting a desired print job stored in reception buffer 203 is input from assigning means while print jobs in units of a specific command group input from the outside are sequentially stored in reception buffer 203, analysis means (CPU 204) analyzes each of the print jobs, obtained analysis information is stored in page buffer 205, and page data obtained from the stored analysis information are stored in frame buffer 207, the input data for assigning deletion of a job is held in RAM (random access memory 211, and CPU 204 deletes the assigned print job stored in reception buffer 203 based on the state of registration of the data for assigning deletion of a job in RAM 211, or deletes analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, based on the assigned print job. Accordingly, even if a plurality of print jobs are stored in reception buffer 203, it is possible to delete only the assigned print job, as well as analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job.

In addition, since data for assigning deletion of a job for deleting a desired print job stored in reception buffer 203 is input from the operation panel of the main body of the printer, the assignment of deletion of a print job input from the outside can be performed at the side of the main body of the apparatus.

Furthermore, since data for assigning deletion of a job for deleting a desired print job stored in reception buffer 203 is input from external host computer 201, the assignment of deletion of a print job input from the

outside can be performed from the data source.

First, a description will be provided of the operation of data processing from host computer 201 with reference to FIG. 3.

FIG. 3 is a flowchart illustrating a main processing procedure in the printing-information processing apparatus shown in FIG. 2. Numerals (1) - (5) represent respective steps.

First, reception processing is performed when printing data has been input (step (1)). Upon completion of the reception processing, analysis processing of the printing data is performed (step (2)), and bit-map data development processing is performed (step (3)). Thereafter, output processing of outputting developed bit-map data to a printer engine (not shown) is performed (step (4)). In step (5), it is determined if the input of information has ended. If the result of the determination is negative, the process returns to step (1). If the result of the determination is affirmative, the processing is terminated. While such processing is executed, CPU 204 monitors if an interrupt request of job-clear processing has occurred from the outside through the operation panel or the like. When an interrupt request of job-clear processing has been recognized, job-clear interrupt processing shown in FIG. 4 is started.

FIG. 4 is a flowchart illustrating the procedure of first job-clear interrupt processing in the printing-information processing apparatus of the present invention. Numerals (1) - (8) represent respective steps.

First, it is determined if the job to be cleared is a job currently being analyzed, developed or output (step (1)). If the result of the determination is affirmative, data being output is output. At the same time, if data being developed is present in frame buffer 207, that data is cleared (step (5)). If data corresponding to the target job is present in page buffer 205, that data is cleared (step (6)). If data of the target job is present in reception buffer 203, that data is cleared (step (7)), and the process proceeds to analysis processing of the next job (step (8)).

If the result of the detemination in step (1) is negative, it is determined if the job to be cleared is present in reception buffer 203 (step (2)). If the result of the determination is negative, the process returns to ordinary processing. If the result of the determination is affirmative, a job-clear flag is switched on (step (3)), and the name of the job to be cleared is set in an assigned storage area (step (4)), and the process returns to the main processing shown in FIG. 3.

FIG. 5 is a flowchart illustrating a detailed procedure of the analysis processing routine shown in FIG. 3. Numerals (1) - (5) represent respective steps.

First, it is determined if a job-clear flag is switched on according to the flowchart shown in FIG. 4. If the result of the determination is negative, the process proceeds to step (3), where ordinary analysis processing is executed, and the process is terminated.

If the result of the determination in step (1) is affirmative, it is determined if the job transferred from reception buffer 203 is the job to be cleared by comparing the transferred job with the name of the job set in the storage area (step (2)). If the result of the determination is negative, the process proceeds to step (3). If the result of the determination is affirmative, the target job is deleted from reception buffer 203 (step (4)), the job-clear flag is reset (step (5)), and the process returns to the main processing.

Accordingly, as shown in FIG. 6, when a command to clear job #2 has been input to input means 202 from the outside (for example, from the operation panel or from host computer 201, serving as the host apparatus) while jobs #1 - #3 are stacked in reception buffer 203 and job #1 is being analyzed, developed and output, printing data for job #2 is deleted after the completion of the processing of job #1. As a result, only job #3 remains stacked on reception buffer 203, and the processing of analyzing, developing and outputting job #3 is started.

As described above, in the printing-information processing method of the present invention, while print jobs input from the outside are sequentially stored in reception buffer 203, analysis information of each of the stored print jobs is stored in page buffer 205 in parallel to the reception of the print jobs, and page data obtained from the stored analysis information are sequentially stored in frame buffer 207, data for assigning deletion of a job input from the outside is stored in RAM 211. The assigned print job stored in reception buffer 203, or analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job is deleted by analyzing the stored data for assiging deletion of a job. Hence, even if a plurality of print jobs are stored in reception buffer 203, it is possible to delete only the assigned print job, as well as analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job.

In the above-described embodiment, a description has been provided of the case in which allocation of data from input means 202 is not performed within reception buffer 203. However, in printer having a plurality of input means in which data can be allocated in reception buffer 203 so as to correspond to the respective input means, the corresponding input means may be assigned in job-clear assignment. That is, since print jobs input via respective data input units (not shown) are registered in reception buffer 203 while being allocated by CPU 204, it is possible to delete only the print job input via the assigned data input unit from reception buffer 203, as well as analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job.

Second Embodiment

FIG. 7 is a flowchart illustrating the procedure of second job-clear interrupt processing in the printing-information processing apparatus of the present invention. Numerals (1) - (6) represent respective steps.

When a job-clear interrupt has been received from the outside in the main processing shown in FIG. 3, it is determined if the job received from input means which assigns job clear is currently being subjected to analysis/development/output processing (step (1)). If the result of the determination is affirmative, in parallel with the processing of outputting printing data being output, if it is present, the contents of frame buffer 207 performing development processing are cleared (step (4)), the contents of page buffer 205 performing analysis processing are cleared (step (5)), the corresponding job remaining in reception buffer 203 is cleared (step (6)), and the process returns to step (2).

On the other hand, if the result of the determination in step (1) is negative, it is determined if the corresponding job is stored in the region of reception buffer 203 corresponding to the input means which assigns job clear (step (2)). If the result of the determination is negative, the process returns to the main processing. If the result of the determination is affirmative, the corresponding job is cleared from reception buffer 203 (step (3)). Thus, the processing is terminated, and the process returns to the main processing.

As described above, in the printing-information processing method of the present invention, while print jobs input from the outside are sequentially stored in reception buffer 203, analysis information of each of the stored print jobs is stored in page buffer 205 in parallel to the reception of the print jobs, and page data obtained from the stored analysis information are sequentially stored in frame buffer 207, data for assigning deletion of a job input from the outside is stored. The assigned print job stored in reception buffer 203, or analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job is deleted by analyzing the stored data for assigning deletion of a job. Hence, even if a plurality of print jobs are stored in reception buffer 203, it is possible to delete only the assigned print job, as well as analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job.

In the printing-information processing apparatus of the present invention, if data for assigning deletion of a job for deleting a desired print job stored in reception buffer 203 is input from assigning means while print jobs in units of a specific command group input from the outside are sequentially stored in reception buffer 203, analysis means analyzes each of the print jobs, obtained analysis information is stored in page buffer 205, and page data obtained from the stored analysis information is stored in frame buffer 207, the input data for assigning deletion of a job is held in holding means, and job deletion means deletes the assigned print job stored in reception buffer 203, or analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job based on the state of registration of the job deletion assigning data in the holding means. Accordingly, even if a plurality of print jobs are stored in reception buffer 203, it is possible to delete only the assigned print job, as well as analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job.

In addition, since data for assigning deletion of a job for deleting a desired print job stored in reception buffer 203 is input from the operation panel of the main body of the printer, the assignment of deletion of a print job input from the outside can be performed at the side of the main body of the apparatus.

Furthermore, since data for assigning deletion of a job for deleting a desired print job stored in reception buffer 203 is input from external host computer 201, the assignment of deletion of a print job input from the outside can be performed from the data source.

Since print jobs input via respective data input units are registered in reception buffer 203 while being allocated by registration means, it is possible to delete only the print job input via the assigned data input unit from reception buffer 203, as well as analysis information or page data stored in page buffer 205 or frame buffer 207, respectively, corresponding to the assigned print job.

Accordingly, the present embodiment has advantages in that, for example, any of print jobs sequentially stored in the reception buffer can be easily selected and deleted.

While the present invention has been described with respect to what is presently considered to be the preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, the present invention is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

Claims

1. A printing-information processing method, comprising the steps of:

storing data for assigning deletion of a job

arbitrarily input by interrupt from the outside while print jobs in units of a specific command group input from the outside are sequentially stored in a reception buffer, analysis information of each of the stored print jobs is stored in a page buffer, and page data obtained from the stored analysis information are sequentially stored in a frame buffer;

analyzing the stored data for assigning deletion of a job; and

deleting an assigned print job stored in the reception buffer, or analysis information or page data stored in the page buffer or frame buffer, respectively, corresponding to the assigned print job.

2. A printing-information processing apparatus, comprising:

a reception buffer for sequentially storing print jobs in units of a specific command group input from the outside;

analysis means for analyzing each of the stored print jobs;

a page buffer for storing analysis information provided by said analysis means;

a frame buffer for storing page data obtained from the analysis information;

assigning means for inputting data for assigning deletion of a job for deleting a print job stored in said reception buffer from the outside;

holding means for holding the data for assigning deletion of a job input from said assigning means; and

job deletion means for deleting the assigned print job stored in said reception data based on a state of registration of the data for assigning deletion of a job in said holding means, or deleting analysis information or page data stored in said page buffer or said frame buffer, respectively, based on the assigned print job.

3. An apparatus according to Claim 2, wherein said assigning means comprises an operation panel provided in a main body of a printer.

4. An apparatus according to Claim 2, wherein said assigning means comprises an external host computer.

5. An apparatus according to any of Claims 2 through 4, further comprising:

a plurality of data input units; and

registration means for registering respective print jobs input via said data input units in said reception buffer while allocating the print jobs.

6. A method according to Claim 1, wherein the data for assigning deletion of a job is obtained by an instruction from an operation panel provided in a main body of a printer.

7. A method according to Claim 1, wherein the data for assigning deletion of a job comprises data from a host computer.

8. Apparatus for processing data for printing comprising means for sequentially storing multiple print jobs, means for analysing each stored job and storing the resultant analysis, and means responsive to an external command to delete a stored print job and/or the stored analysis of the print job.

FIG.1

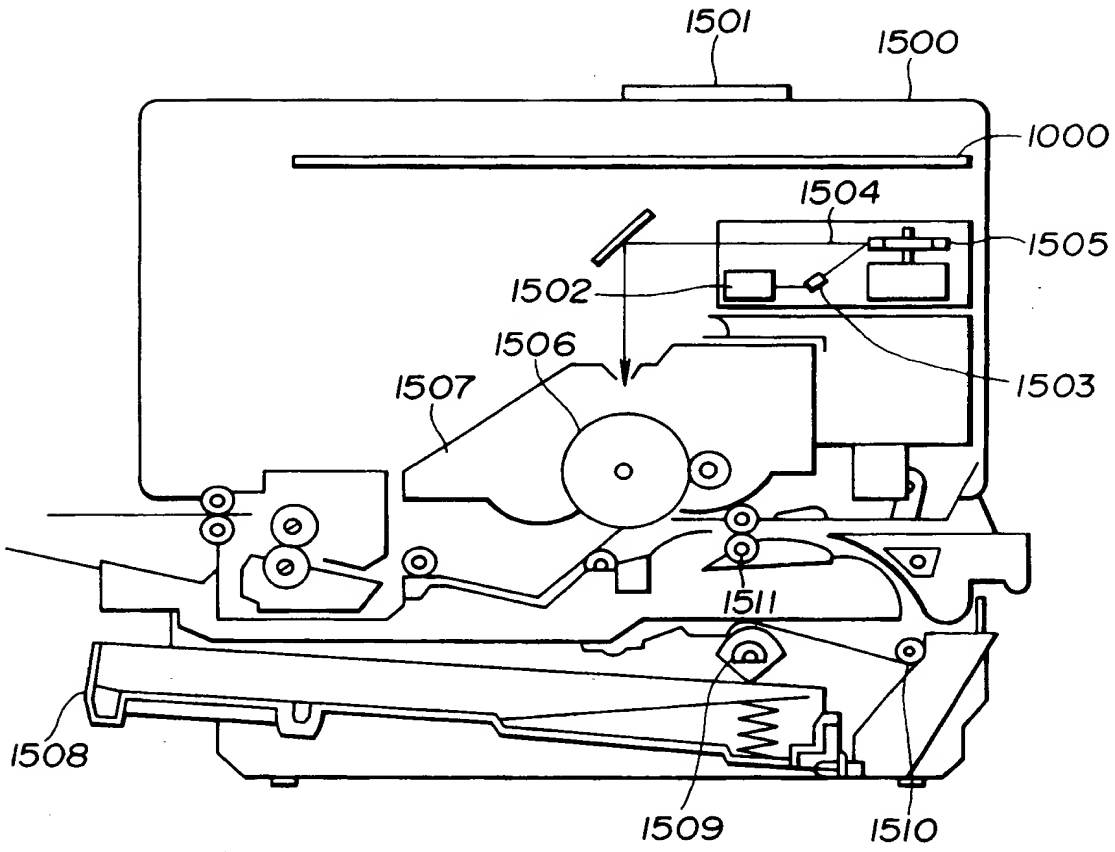

1501
1500
1000
1504
1505
1502
1506
1503
1507
1511
1508
1509
1510

FIG.2

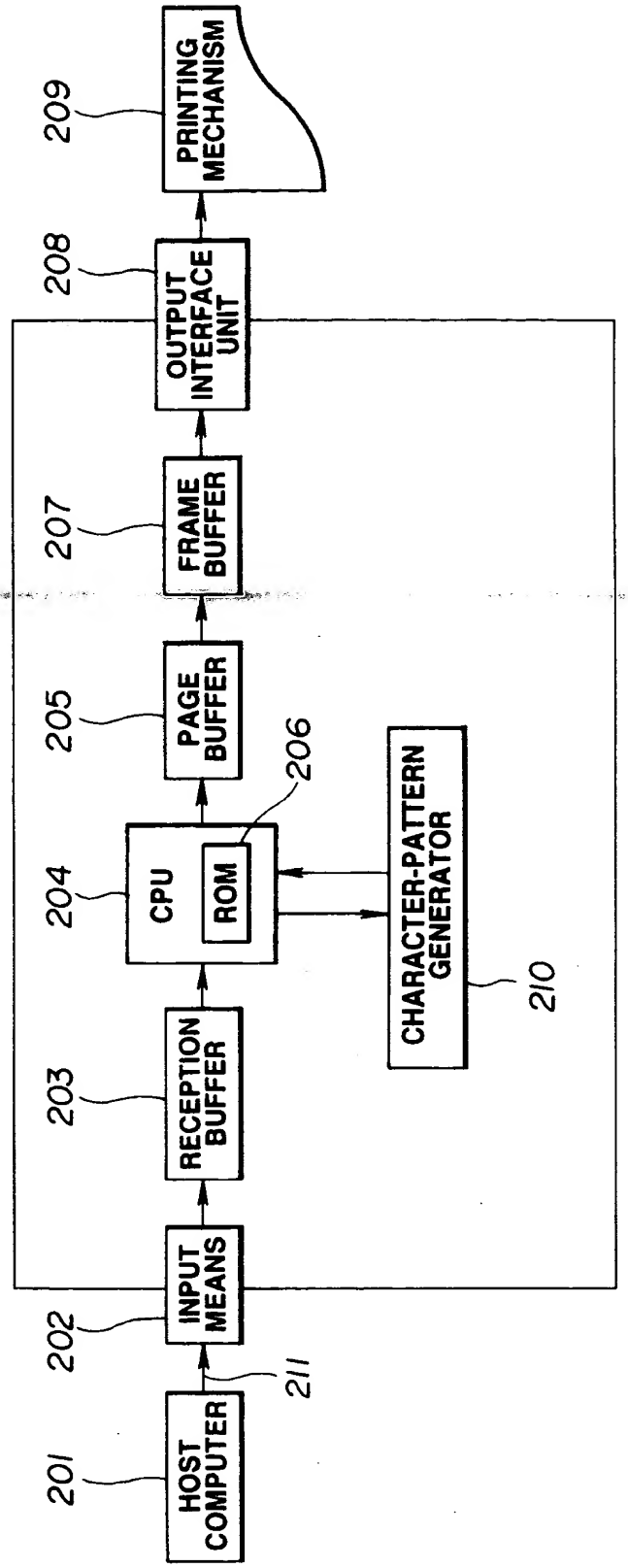

HOST COMPUTER
201
INPUT MEANS
202
211
RECEPTION BUFFER
203
CPU
204
ROM
206
PAGE BUFFER
205
FRAME BUFFER
207
OUTPUT INTERFACE UNIT
208
PRINTING MECHANISM
209
CHARACTER-PATTERN GENERATOR
210

FIG.3

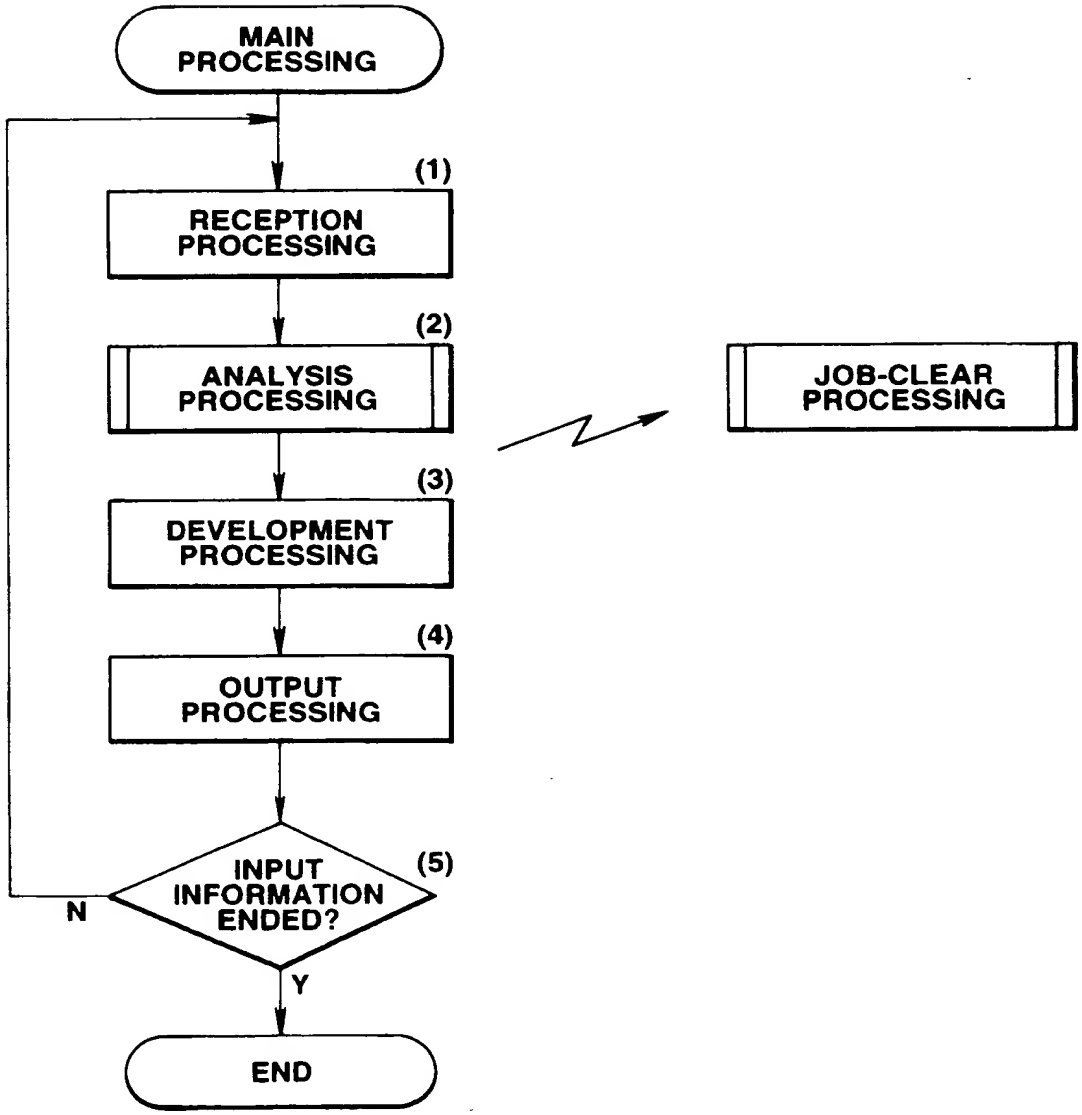

MAIN PROCESSING
(1)
RECEPTION PROCESSING
(2)
ANALYSIS PROCESSING
JOB-CLEAR PROCESSING
(3)
DEVELOPMENT PROCESSING
(4)
OUTPUT PROCESSING
(5)
INPUT INFORMATION ENDED?
N
Y
END

FIG.4

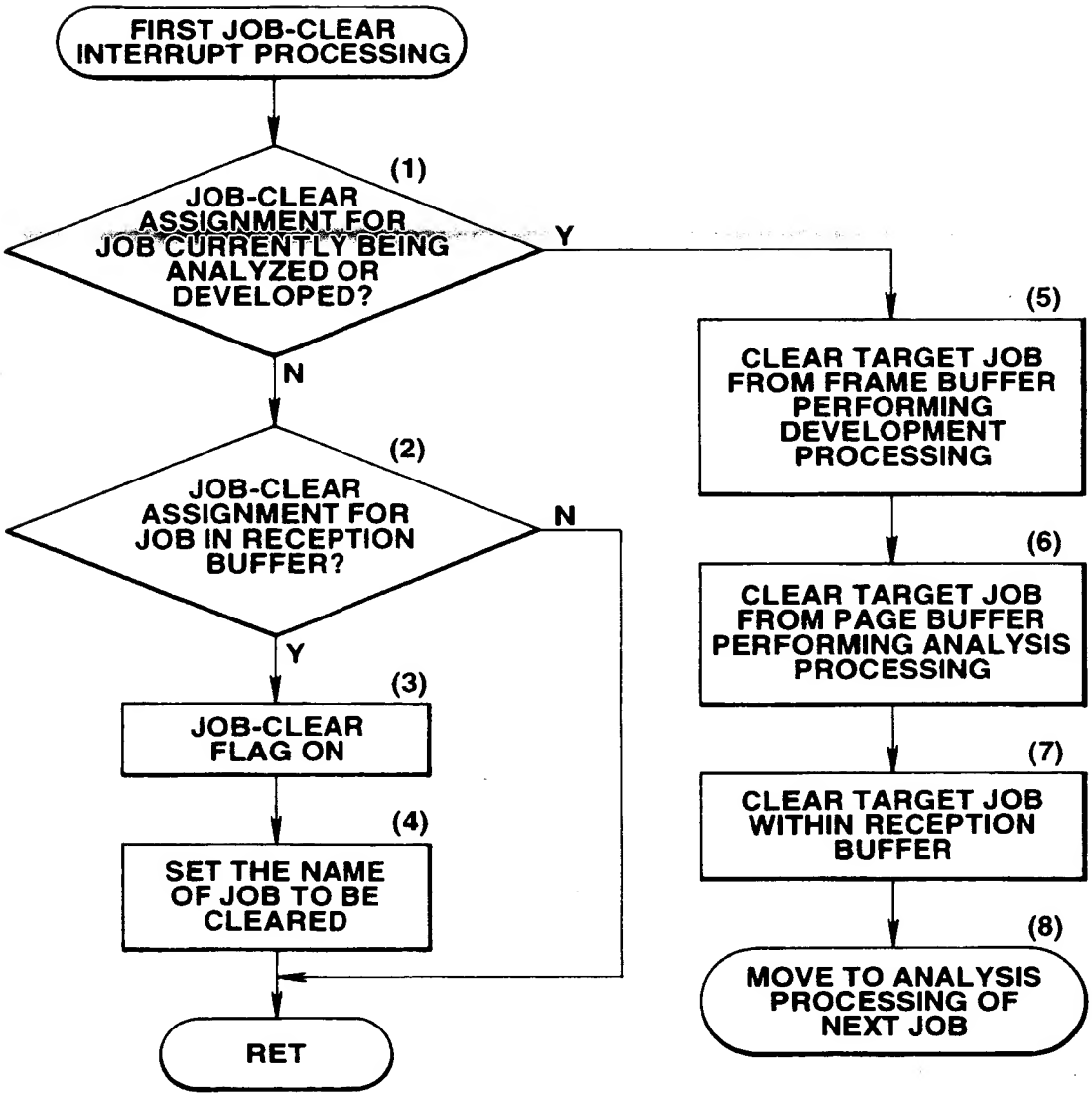

FIRST JOB-CLEAR INTERRUPT PROCESSING
(1)
JOB-CLEAR ASSIGNMENT FOR JOB CURRENTLY BEING ANALYZED OR DEVELOPED?
Y
N
(2)
JOB-CLEAR ASSIGNMENT FOR JOB IN RECEPTION BUFFER?
N
Y
(3)
JOB-CLEAR FLAG ON
(4)
SET THE NAME OF JOB TO BE CLEARED
RET
(5)
CLEAR TARGET JOB FROM FRAME BUFFER PERFORMING DEVELOPMENT PROCESSING
(6)
CLEAR TARGET JOB FROM PAGE BUFFER PERFORMING ANALYSIS PROCESSING
(7)
CLEAR TARGET JOB WITHIN RECEPTION BUFFER
(8)
MOVE TO ANALYSIS PROCESSING OF NEXT JOB

FIG.5

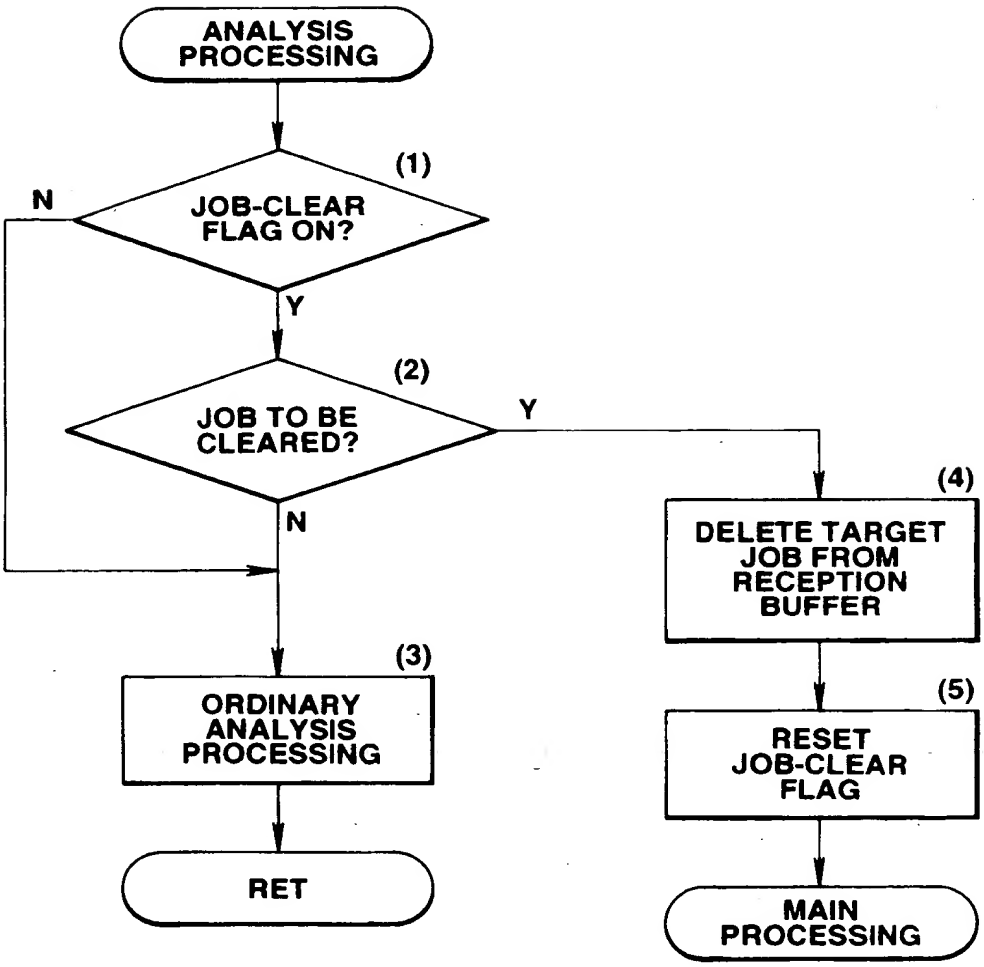

ANALYSIS PROCESSING
(1)
JOB-CLEAR FLAG ON?
N
Y
(2)
JOB TO BE CLEARED?
Y
N
(4)
DELETE TARGET JOB FROM RECEPTION BUFFER
(3)
ORDINARY ANALYSIS PROCESSING
(5)
RESET JOB-CLEAR FLAG
RET
MAIN PROCESSING

FIG.6

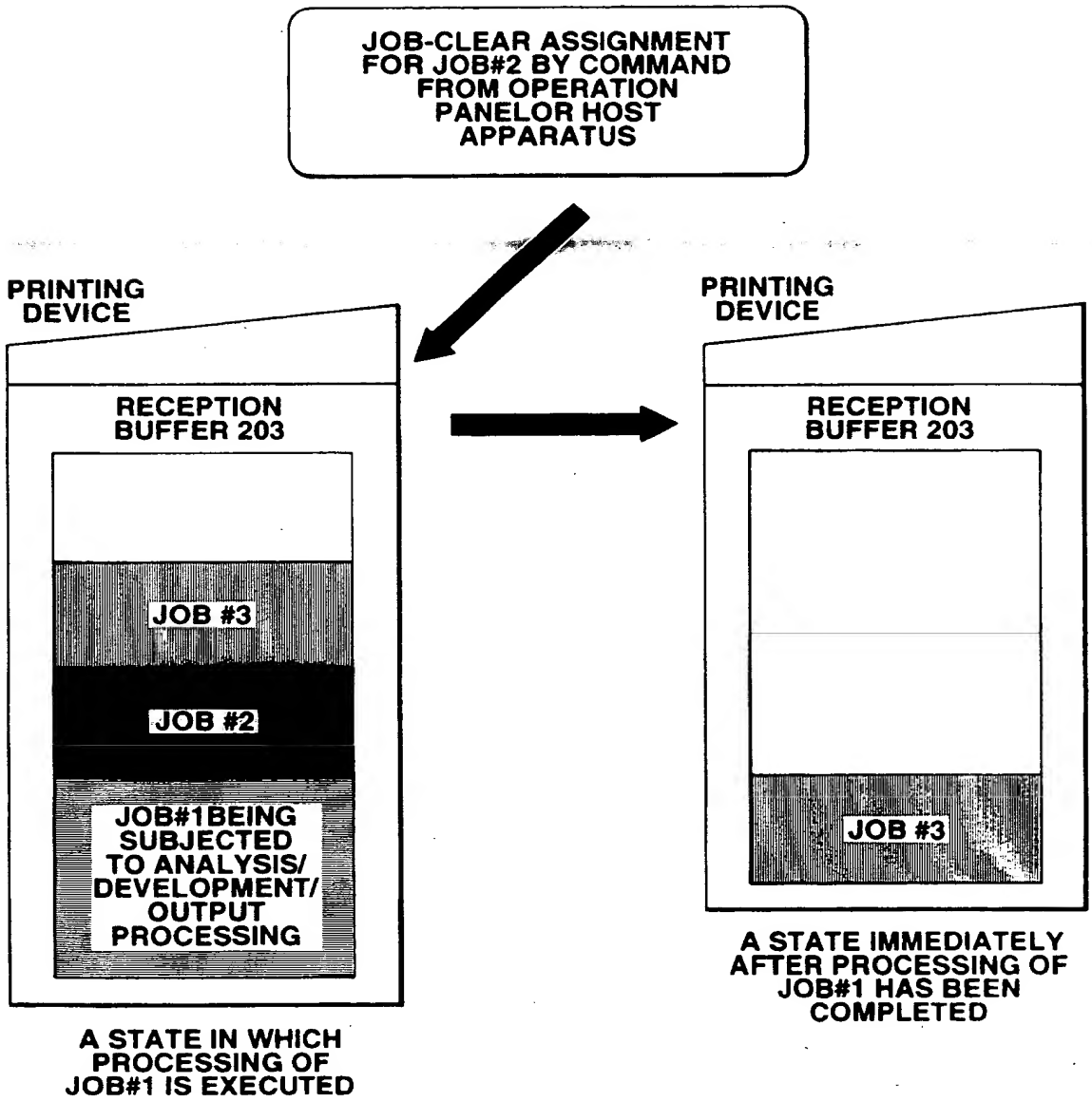
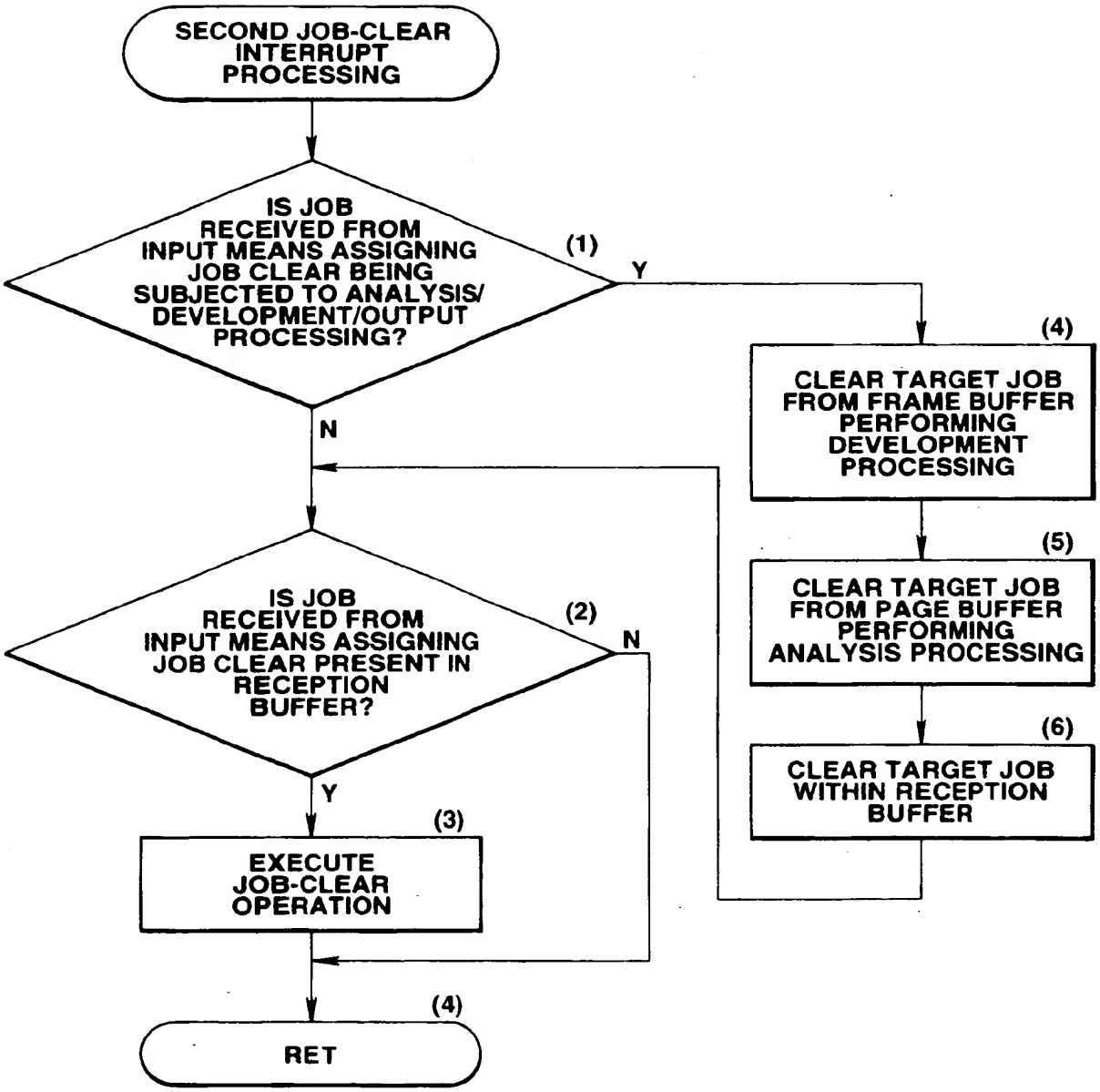

JOB-CLEAR ASSIGNMENT FOR JOB#2 BY COMMAND FROM OPERATION PANELOR HOST APPARATUS
PRINTING DEVICE
RECEPTION BUFFER 203
JOB #3
JOB #2
JOB#1BEING SUBJECTED TO ANALYSIS/ DEVELOPMENT/ OUTPUT PROCESSING
A STATE IN WHICH PROCESSING OF JOB#1 IS EXECUTED
PRINTING DEVICE
RECEPTION BUFFER 203
JOB #3
A STATE IMMEDIATELY AFTER PROCESSING OF JOB#1 HAS BEEN COMPLETED

FIG.7


SECOND JOB-CLEAR INTERRUPT PROCESSING
IS JOB RECEIVED FROM INPUT MEANS ASSIGNING JOB CLEAR BEING SUBJECTED TO ANALYSIS/ DEVELOPMENT/OUTPUT PROCESSING?
(1)
Y
N
(4)
CLEAR TARGET JOB FROM FRAME BUFFER PERFORMING DEVELOPMENT PROCESSING
(5)
CLEAR TARGET JOB FROM PAGE BUFFER PERFORMING ANALYSIS PROCESSING
(6)
CLEAR TARGET JOB WITHIN RECEPTION BUFFER
IS JOB RECEIVED FROM INPUT MEANS ASSIGNING JOB CLEAR PRESENT IN RECEPTION BUFFER?
(2)
N
Y
(3)
EXECUTE JOB-CLEAR OPERATION
(4)
RET

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 30 8510

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	IBM TECHNICAL DISCLOSURE BULLETIN. vol. 35, no. 5 , October 1992 , NEW YORK US pages 278 - 280 'PAGE PRINTER MESSAGE HANDLER' * page 278; figure 1 * * page 279, line 9 - line 30 * ---	1,2,4,5, 8	G06F3/12
A	US-A-5 036 476 (YAMAGUCHI ET AL.,) * figures 1-4,15A-B,17 * * figures 28A-B * * column 5, line 15 - column 6, line 4 * * column 16, line 28 - column 18, line 56 * * column 32, line 47 - column 33, line 58 * ---	1-4,6-8	
A	EP-A-0 332 779 (SEIKO EPSON CORPORATION) * figures 1,2 * * column 1, line 25 - line 51 * * column 2, line 17 - column 3, line 4 * ---	1,2,4,5, 8	TECHNICAL FIELDS SEARCHED (Int.Cl.5) G06F
A	EP-A-0 479 494 (XEROX CORPORATION) * figures 17,18 * * column 9, line 54 - column 10, line 23 * -----	1-3,5,8	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	25 February 1994	Weiss, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)